Claims

1. (Currently Amended) A process comprising separating and recovering 3-hydroxypropionic acid from an aqueous solution comprising 3-hydroxypropionic acid and acrylic acid, by contacting the aqueous solution with an organic phase comprising an organic extractant other than ethyl acetate, wherein the organic extractant comprises ~~comprising~~ an alcohol, an ether, an ester, a ketone, an amide, a phosphorus ester, a halogenated compound, an aromatic compound, a phosphine oxide, a phosphine sulfide, an alkyl sulfide, and mixtures thereof, and wherein the organic extractant consists essentially of one or more components having boiling points lower than about 100°C ~~does not comprise a lactam having 4 to 7 ring members and a hydrocarbon radical as a substituent on the nitrogen atom or comprise ethyl acetate~~.

2. (Original) The process according to claim 1, wherein the organic extractant is selected from the group consisting of an alcohol, an ether, an ester, a ketone, an amide, a phosphorus ester, a halogenated compound, an aromatic compound, a phosphine oxide, a phosphine sulfide, an alkyl sulfide, and mixtures thereof.

3. (Currently Amended) The process according to claim 1, wherein the organic extractant is selected from the group consisting of ~~decanol~~, methyl isobutyl ketone, isopropyl ether, methyl acrylate, methyl propionate, methylene chloride, toluene, isopropyl acetate, tributyl phosphate and mixtures thereof.

4. (Previously presented) The process according to claim 1, wherein, without further purification, the 3-hydroxypropionic acid recovered is at least about 80% pure.

5. (Previously presented) The process according to claim 1, wherein the separation process of acrylic acid and 3-hydroxypropionic acid has a separation factor of equal to or greater than 5.

6. (Original) The process according to claim 1, wherein the process is conducted at a volume ratio of organic phase to aqueous solution ranging from about 20: 1 to about 1: 20.

7. (Original) The process according to claim 1, wherein the process is a counter current extraction, co-current extraction, or cross current extraction.

8. (Previously presented) The process of claim 1 further comprising separating and recovering acrylic acid from the organic phase by contacting the organic phase with water.

9. (Original) The process according to claim 8, wherein the process is conducted at a temperature ranging from about 0°C to about 180°C.

10. (Original) The process according to Claim 8, wherein the process is conducted at a volume ratio of organic phase to aqueous phase ranging from about 20: 1 to about 1: 20.

11. (Currently Amended) The process of claim 1 further comprising separating and recovering acrylic acid from the organic phase, after the aqueous solution is contacted with the organic phase, wherein the organic phase comprises acrylic acid and an organic extractant having a boiling point lower than about 100°C, by heating the organic phase, in the presence of water, to distill the organic extractant.

12. (Currently Amended) The process according to claim 11, wherein the distillation is conducted at a temperature that is no greater than about 100°C and at a pressure that is less than or equal to atmospheric pressure.

13. (Original) The process according to claim 11, wherein the organic extractant is isopropyl ether.

14. (Currently Amended) A process comprising:

a. separating and recovering 3-hydroxypropionic acid and acrylic acid from an aqueous solution comprising 3-hydroxypropionic acid and acrylic acid, by contacting the aqueous solution with an organic phase comprising an organic extractant other than ethyl acetate, wherein the organic extractant consists essentially of one or more components having boiling points lower than about 100°C, ~~or a radical lactam~~, to extract the acrylic acid into the organic phase and recover the 3-hydroxypropionic acid in the aqueous solution;

b. contacting the organic phase formed in step (a) with water to extract the acrylic acid from the organic phase; and

c. wherein the separating and recovering acrylic acid and 3-hydroxypropionic acid from the aqueous solution has a separation factor of equal to or greater than 5.

15. (Previously Presented) The process according to claim 14, wherein the organic extractant is selected from the group consisting of an alcohol, an ether, an ester, a ketone, an amide, a phosphorus ester, a halogenated compound, an aromatic compound, a phosphine oxide, a phosphine sulfide, an alkyl sulfide, and mixtures thereof.

16. (Original) The process according to claim 14, wherein the organic extractant is present in the organic phase in an amount ranging from about 1 to about 100 weight percent.

17. (Currently Amended) A process comprising:

a. separating and recovering ~~3-hydroxyproprionic~~ 3-hydroxypropionic acid and acrylic acid from an aqueous solution comprising 3-hydroxypropionic acid and acrylic acid by contacting the aqueous solution with an organic phase comprising an organic extractant[[,]] other than ethyl acetate, ~~or a radical lactam, that has a~~ wherein the organic extractant consists essentially of one or more components having boiling ~~point~~ points lower than about 100°C, to extract the acrylic acid into the organic phase and recover the 3-hydroxypropionic acid in the aqueous solution;

b. heating the organic phase formed [[is]] in step (a), in the presence of water, to distill off the organic extractant, thereby forming an aqueous acrylic acid solution; and

c. wherein the separating and recovering acrylic acid and 3-hydroxypropionic acid from the aqueous solution has a separation factor of equal to or greater than 5.